CD127/IL-7RA Protein, Human (236a.a, HEK293, Fc)

Cat. No.:	HY-P76433
Synonyms:	Interleukin-7 receptor subunit alpha; IL7R; IL-7R-alpha; CD127
Species:	Human
Source:	HEK293
Accession:	P16871 (M1-G236)
Gene ID:	3575
Molecular Weight:	Approximately 51.6 kDa.

PROPERTIES

Appearance	Lyophilized powder.
Formulation	Lyophilized from a 0.2 μm filtered solution of PBS, pH 7.4. Normally 5 % - 8 % trehalose, mannitol and 0.01% Tween 80 are added as protectants before lyophilization.
Endotoxin Level	<1 EU/μg, determined by LAL method.
Reconsititution	It is not recommended to reconstitute to a concentration less than 100 μg/mL in ddH_2O.
Storage & Stability	Stored at -20°C for 2 years. After reconstitution, it is stable at 4°C for 1 week or -20°C for longer (with carrier protein). It is recommended to freeze aliquots at -20°C or -80°C for extended storage.
Shipping	Room temperature in continental US; may vary elsewhere.

DESCRIPTION

Background

IL-7R α-chain (IL-7RA; also known as CD127) is a type 1 membrane glycoprotein folded to bind and mediate the action of IL-7 and other alpha helical cytokines. IL-7RA is almost exclusively expressed by cells of the lymphoid lineage that plays an important role in lymphocyte differentiation, proliferation, and survival. IL-7RA gene is localised on chromosome 5p13.3[1][2].

The amino acid sequence of human IL-7RA protein has low homology between mouse and rat IL-7RA protein. While, human IL-7RA shares 97% aa sequence identity with monkey IL-7RA protein.

IL-7 is classified as a type 1 short-chain cytokine of the hematopoietin family. Physiologic roles of IL-7 involve modulation of T- and B-cell development and T-cell homeostasis. To perform all pleiotropic functions of IL-7 in immune system, IL-7 binds through a transmembrane receptor, which is formed by heterodimerizing of the common cytokine gamma chain (γc; also known as CD132) and IL-7RA. IL-7RA consists of an extracellular domain, transmembrane region and cytoplasmic tail, that recruits kinases for signal transduction. IL-7RA is organized in eight exons, spanning 18 kb of genomic DNA. The protein has a folding typical for the insertion of a helical cytokine, and it is composed of an intracellular domain (195 aa), a transmembrane domain (25 aa), and an extracellular region (220 aa). The latter shares homology with other members of the type I family of cytokine receptors. Close to the transmembrane domain, the extracellular region of IL-7Ra contains a Trp-Ser-X-Trp-Ser (WSXWS) motif involved in proper folding of the protein. Finally, the extracellular region also contains two

fibronectin type III-like domains. Soluble or membrane-bound isoforms of IL-7RA are produced according to the alternative splicing of exon 6 in IL7RA gene. IL-7RA also acts as a receptor for thymic stromal lymphopoietin (TSLP)[1][2][3].
IL-7RA associates with γc to form the functional high affinity IL-7 receptor complex. The natural killer T cells require signals from IL-7RA for their development. The common characteristic of all types of severe combined immunodeficiency (SCID) is absence of T-cell-mediated cellular immunity due to a defect in T-cell development. Defects in IL-7RA may be associated with SCID. Meanwhile, single nucleotide polymorphisms in IL7RA gene are involved in the dysregulation of immune homeostasis and susceptibility to multiple sclerosis (MS). IL-7RA is a receptor for TSLP. TSLP indirectly regulates T cell development by modulating dendritic cell activation[1][3].

REFERENCES

[1]. Daniel Čierny, et al. Genetic variants in interleukin 7 receptor α chain (IL-7Ra) are associated with multiple sclerosis risk and disability progression in Central European Slovak population. J Neuroimmunol. 2015 May 15;282:80-4.

[2]. Renata Mazzucchelli, et al. Interleukin-7 receptor expression: intelligent design. Nat Rev Immunol. 2007 Feb;7(2):144-54.

[3]. Silvia Giliani, et al. Interleukin-7 receptor alpha (IL-7Ralpha) deficiency: cellular and molecular bases. Analysis of clinical, immunological, and molecular features in 16 novel patients. Immunol Rev. 2005 Feb;203:110-26.

[4]. Sarita A Y Hartgring, et al. Elevated expression of interleukin-7 receptor in inflamed joints mediates interleukin-7-induced immune activation in rheumatoid arthritis. Arthritis Rheum. 2009 Sep;60(9):2595-605.

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